

**REMARKS/ARGUMENTS**

Claims 1-30 are pending. Claims 1-30 have been rejected. Claims 1-18, 22, 23 and 29 have been amended. Claims 19-21 and 25-28 have been canceled. New Claims 31-33 have been added. Claims pending after amendment are 1-18, 22- 24 and 29-33. The amendments are supported as follows:

| <u>Claim</u> | <u>Support</u>  |
|--------------|---|
| 1            | page 11, line 15, page 16, line 4 and original claims 4 and 5   |
| 2            | page 16, lines 15-20  |
| 3            | claim dependency amended only   |
| 4            | paragraph bridging pages 15 and 16  |
| 5            | page 15, lines 21 and 22  |
| 6            | page 15, lines 21 and 22  |
| 7            | page 15, line 22  |
| 8            | page 15, line 22 and page 16, line 1  |
| 9            | original claims 1 and 4 and page 16, line 4   |
| 10           | original claim 10   |
| 11           | page 16, lines 16-20  |
| 12           | original claim 12 (dependency and antecedent basis clarification)   |
| 13           | original claim 13 (dependency and antecedent basis clarification)   |
| 14           | paragraph bridging pages 15 and 16  |
| 15           | page 15, lines 21 and 22  |
| 16           | page 15, lines 21 and 22  |
| 17           | page 15, line 22  |
| 18           | page 15, line 22 and page 16, line 1  |
| 22           | original claim 9  |
| 23           | original claim 23 (claim dependence and antecedent basis clarification)   |
| 29           | original claim 29 (claim dependence and antecedent basis clarification)   |
| 31           | original claim 1 and page 15 line 22 (zinc stearate melting point about 120°C as per enclosed Ferro Corp. product literature) |
| 32           | page 15, lines 21 and 22  |
| 33           | page 15, lines 21 and 22 (lithium stearate melting point about 212°C as per enclosed Ferro Corp. product literature)          |

### THE §102(b) REJECTION

Claims 1-3, 6-8, 11-13, 15-17, 19-21, and 25-27 have been rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent No. JP Patent Bulletin No 60-17174 (Ikeda herein).

The Office Action states:

Ikeda discloses the instantly claimed invention at page 1, claim 1; page 2, lines 1-35, particularly 22-35; page 3, lines 1-36, particularly 19-23; page 4, lines 9 and 12 of which the sulfonic acid salt is a "salt of a hydrophobic acid", page 6, table 1. Prior to mixing, the ingredients of the reference fall within the instantly claimed "kit".

Applicants respectfully disagree and respond as follows. As amended Claim 1 now requires that the aqueous dispersed polymeric composition is comprised of a polyurethane dispersion. Ikeda fails to describe a polyurethane dispersion. For this reason Claim 1 and Claims dependent therefrom are novel.

Amended independent Claims 1 and 9 require that the aqueous dispersed polymeric composition is comprised of a hydrophobic salt of a hydrophobic acid. Ikeda fails to describe a hydrophobic salt of a hydrophobic acid. Even though Ikeda does describe "condensed naphthalene sulfonic acid sodium salt", this compound is being used as a dispersant and is soluble in water and as such is not a hydrophobic salt (see enclosed DAXAD™ dispersant product literature). Hydrophobic means "antagonistic to water, incapable of dissolving in water." *Hawley's Condensed Chemical Dictionary 12<sup>th</sup> Ed.*, p. 618, R. Lewis Sr., Van Nostrand Reinhold Co., NY, NY (1993). Consequently, Ikeda does not anticipate a "hydrophobic salt of a hydrophobic acid" as now required in Claims 1 and 9. For the above reasons, amended Claims 1 and 9 and Claims dependent therefrom are novel.

New independent Claim 31 is novel because Ikeda fails to describe a hydrophobic compound that is a hydrophobic acid or salt of a hydrophobic acid that has a melting point of at least about 120°C. For this reason, new Claim 31 and Claims dependent therefrom are novel. Note, the condensed naphthalene sulfonic acid sodium salt described by Ikeda is a dispersant that is soluble in water and is formed from naphthalene sulfonic acid,

which is also soluble in water (i.e., hydrophilic). (see Merck Index 13<sup>th</sup> Edition, 6403, attached).

#### THE §103(a) REJECTION

Claims 1-30 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Ikeda in view of DE 3215890 (Grochal herein). In the rejection, the Office Action refers to the same cites in Ikeda as described above and states:

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to treat the fillers of Ikeda according to the instant claims and with the instantly claimed compounds because the resulting properties disclosed by Grochal et al. would have been expected in the product of Ikeda.

As amended, independent Claims 1 and 9 each require that the hydrophobic compound is a hydrophobic salt of a hydrophobic acid. From this, these claims require the salt to be hydrophobic and by definition essentially insoluble in water.

Ikeda fails to describe any specific salt except the one previously described, which is soluble in water. The only requirement that Ikeda places on the metal salt is that it has a melting range of 80°C to 100°C (Ikeda, page 2, lines 1-35, particularly 22-35). Thus, Ikeda is utterly silent as to what salt to use and as such fails to suggest to one of ordinary skill in the art to use such a hydrophobic salt of a hydrophobic acid.

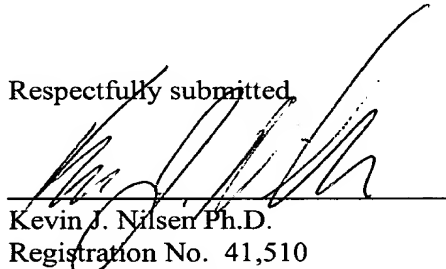
Grochal, when referring, for example, to carboxylic acids such as stearic acid, teaches that "the acids mentioned previously are usually not sufficiently soluble as free acids for the purposes of the invention, as a rule their water soluble salts are used, such as ammonium salts, salts of amines, alkali salts such as sodium or potassium salts. (Grochal, page 9, second full paragraph). Thus, Grochal specifically teaches that the salt of a hydrophobic acid must be the water soluble salt of that hydrophobic acid (e.g., sodium salts thereof). Consequently, when Ikeda is taken in view of Grochal, there is no suggestion to one of ordinary skill in the art to use a hydrophobic salt of a hydrophobic acid, but instead, Grochal specifically teaches away from a hydrophobic salt of a hydrophobic acid such as

zinc stearate. For this reason, Claims 1 and 9 and Claims dependent therefrom are non-obvious.

In addition, Ikeda specifically teaches that the water repellant, be it a metal salt or otherwise, must have a melting point less than 100°C. New independent Claim 31 requires that the hydrophobic compound has a melting temperature of at least about 120°C. Ikeda specifically teaches that if the water repellant has a melting temperature of greater than 100°C, "the adhesive will not melt easily in the process of heating and drying it after it has been applied to the carpet the water-repellant property will not be easily imparted to the adhesive." (Ikeda, page 3, last sentence). From this, Ikeda not only fails to suggest a hydrophobic compound that is a hydrophobic acid, salt of a hydrophobic acid or mixture thereof that has a melting temperature of at least about 120°C, but teaches away from this type of water repellant. Thus, even if Grochal described or suggested a salt of a hydrophobic acid having a high melting temperature, which he does not, Ikeda taken with Grochal would still fail to suggest to one of ordinary skill in the art to make the invention of Claim 31. That is, one of ordinary skill in the art would only employ those water repellants having the melting temperature specified by Ikeda. For this reason, Claim 31 and Claims dependent therefrom are non-obvious.

Considering the foregoing reasons, Claims 1-18, 22-24 and 29-33 are patentable. Applicants, therefore, respectfully request withdrawal of all rejections and allowance of Claims 1-18, 22-24 and 29-33.

Respectfully submitted,



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## Products and Markets

### Foundry & Powdered Metal Lubricants : Synpro® Lithium Stearate

### Synpro® Lithium Stearate

### Lubricant Product Profile

#### Product Description

Synpro® Lithium Stearate Lubricant serves as an excellent gelling agent for a wide variety of grease applications. Greases employing Synpro® Lithium Stearate exhibit a wide range of operating temperatures, far greater than those of Aluminum or Sodium soaps. In addition, it provides high dropping points, water resistance and transparency in such multipurpose greases.

Synpro® Lithium Stearate also finds use in the powder metallurgy industry, being especially employed in the pressing of brass and stainless steel compacts. High volatilization, coupled with low ash content, are its main advantages.

#### Safety and Handling

Complete toxicity and handling information can be found on the Material Safety Data Sheet, which is available upon request.

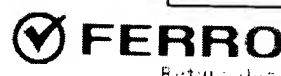
#### Typical Properties

|                   |                      |
|-------------------|----------------------|
| % Ash             | 5.4                  |
| % Free Fatty Acid | 0.5                  |
| % Moisture        | 0.3                  |
| Melting Point     | 212°C                |
| Apparent Density  | 0.3 gm/cc            |
| Fineness          | 92% passing 200 mesh |

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**Products and Markets****Fiberglass-Reinforced Polyester Lubricants : Synpro®  
Zinc Stearate XF-100****Synpro® Zinc Stearate XF-100****Lubricant Product Profile****Product Description**

Synpro® Zinc Stearate XF-100 Lubricant is an extremely fine particle-size Zinc Stearate. It has a low average particle size, is highly dispersible and is an excellent lubricant.

Synpro® Zinc Stearate XF-100 is ideal for polymer applications requiring consistently fine particle size and excellent dispersibility. In fiber-reinforced polyesters, the consistent fine particle size allows for viscosity and mixing control and ensures high quality surfaces with most compounds. For color concentrates, Synpro® Zinc Stearate XF-100 improves pigment dispersion and reduces the blending time needed to produce uniform mixtures.

The particle size of Synpro® Zinc Stearate XF-100 allows for uniform coverage when used as a dusting powder for uncured rubber stock where even light coatings are desired.

**Safety and Handling**

Complete toxicity and handling information can be found on the Material Safety Data Sheet, which is available on request.

**Typical Properties**

|                   |                        |
|-------------------|------------------------|
| % Ash             | 13.6                   |
| % Free Fatty Acid | 0.3                    |
| % Moisture        | 0.2                    |
| Melting Point     | 120°C                  |
| Fineness          | 99.8% passing 325 mesh |

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# DAXAD Dispersants

## High Molecular Weight Products

### Description

DAXAD™ high molecular weight dispersing agents are high activity products that effectively disperse finely divided solids and droplets of liquids or gases in aqueous environments. The line of DAXAD dispersing agents includes a variety of high molecular weight products to meet a wide range of difficult slurry, emulsion, and suspension problems.

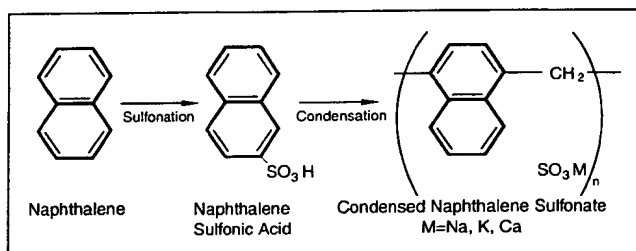
### Applications

Applications for high molecular weight DAXAD dispersants include:

- High-range water reducers and superplasticizers for wet and dry concrete mixes help to improve workability and cured concrete strength properties.
- Water reducers for gypsum board increase board strength and throughput while minimizing retardation effects.
- Clay enhancers increase throughput and yield in brick and other structural ceramic manufacturing.
- Stabilizers and viscosity reducers in coal-water slurries used to obtain maximum energy per unit of fuel in pipeline transport.
- Dispersing agents in pigment grinding and printing inks help to reduce grinding times, yield pastes of higher solids concentrations, and enhance covering power of inks and dyes.
- Dispersing agents in cement formulations for oil well cementing
- Dispersing agents used in the paste formulation of an automobile battery's negative electrode plates to improve the paste's strength and lifetime.
- Dispersing agents added to sulfate galvanizing electrolyte/buffering agent mixtures in the electroplating process to enhance coating applications and current efficiency.
- Re-suspending aids for agricultural chemicals to ensure spray-dried powders can be easily re-wetted into dispersed, non-settling, water-based products.

### Chemistry

DAXAD dispersants are condensation products of naphthalene sulfonic acids. Naphthalene is reacted with sulfuric acid to form naphthalene sulfonic acid. This material is then condensed with formaldehyde. Once condensed, the polymerized naphthalene sulfonic acid molecule may be neutralized with various bases such as sodium, potassium, and calcium to produce high activity dispersing agents in dry or liquid form.



Synthesis of the molecule

### Choosing high vs. low molecular weight products

High molecular weight DAXAD dispersants are suitable for high solids solutions of 20–90% organics in water. Applications for high molecular weight DAXAD dispersants include wet and dry concrete mixes, oil well cementing applications, gypsum board production, clay and other structural ceramic manufacturing, coal-fuel aqueous slurries, pigment grinding and printing inks, lead storage batteries, electroplating, and agricultural chemicals.

Low molecular weight DAXAD dispersants are effective in low solids solutions of 1–20% organics in water. Applications for low molecular weight DAXAD dispersants include leather tanning and textile dyeing, emulsion polymers, pulp and paper, pigment grinding and printing inks, and agricultural chemicals. For more information about low molecular weight DAXAD dispersants, request form number 472-00018.



**Typical properties\* of high molecular weight DAXAD dispersants**

| Property                               | DAXAD 19     | DAXAD 19L42                   | DAXAD 19LCA                   | DAXAD 19LCAD | DAXAD 19LKN                   | DAXAD 19LLS                   | DAXAD 19LS   | DAXAD 19P    |
|--|--------------|-------------------------------|-------------------------------|--------------|-------------------------------|-------------------------------|--------------|--------------|
| Appearance                             | Amber powder | Transparent dark brown liquid | Transparent dark brown liquid | Amber powder | Transparent dark brown liquid | Transparent dark brown liquid | Amber powder | Amber powder |
| Minimum solids content (%)             | 95           | 41                            | 38                            | 93           | 40.5                          | 40                            | 94           | 95           |
| Cation                                 | Sodium       | Sodium                        | Calcium                       | Calcium      | Sodium/Potassium              | Sodium                        | Sodium       | Sodium       |
| Minimum actives content (%)            | 83.5         | 37                            | 38                            | 91.5         | 36                            | 38                            | 90           | 83.5         |
| Surface tension 1 wt % sol. (dynes/cm) | 70–72        | 70–72                         | 70–72                         | 70–72        | 70–72                         | 70–72                         | 70–72        | 70–72        |
| pH of 1 wt % sol.                      | 8.5–10       | 9.0–10.0                      | 7.5–11.5                      | 8.0–9.5      | 9.0–11.0                      | 7.5–10.0                      | 8.5–10.0     | 8.5–10.0     |
| Dry tapped bulk kg/m <sup>3</sup>      | 710          | —                             | —                             | 650          | —                             | —                             | 730          | 650          |
| sp.g. (g/ml)                           | —            | 1.2                           | 1.2                           | —            | 1.2                           | 1.2                           | —            | —            |
| Gardner color                          | —            | —                             | —                             | —            | —                             | —                             | —            | 4            |
| Maximum residual sulfate (dry wt %)    |              |                               |                               |              |                               |                               |              |              |
| as SO <sub>4</sub>                     | 8            | 8                             | 1                             | 1            | 7.5                           | 3                             | 3            | 8            |
| as Na <sub>2</sub> SO <sub>4</sub>     | 12           | 12                            | —                             | —            | —                             | 4.5                           | 4.5          | 12           |

\*The data provided for these properties are typical values, intended only as guides, and should not be construed as sales specifications

**To learn more...**

To learn more about DAXAD dispersants, call 1-800-447-4369 (US and Canada) or fax 1-989-832-1465 to obtain additional literature or product samples.

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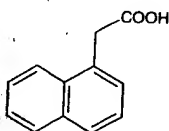
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Manuf phthalic and anthranilic acids which are used in making indigo, indanthrene, and triphenylmethane dyes. Manuf of naphthyl (naphthols), amino (naphthylamines), sulfonic acid and similar compds used in the dye industries. Manuf of synthetic resins, celluloid, lampblack, smokeless powder. Manuf of naphthalenes (Tetralin, Decalin) which are used as solvents in lubricants, and in motor fuels. The use of naphthalene as moth repellent and insecticide is decreasing due to the introduction of chlorinated compds such as *p*-dichlorobenzene.

**APPL:** Has been used as antiseptic (topical and intestinal) and anthelmintic (Cestodes).

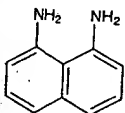
**APPL (VET):** Has been used in dusting powders, as an antiseptic and internally as an intestinal antiseptic and vermifuge.

**7. 1-Naphthaleneacetic Acid.** [86-87-3]  $\alpha$ -Naphthaleneacetic acid; naphthylacetic acid; NAA; Fruitone-N; Planolone-Hold.  $C_{12}H_{10}O_2$ ; mol wt 186.21. C 77.40%, H 5.41%, O 17.18%. Prep from naphthalene + chloroacetic acid: Ogata, *J. Am. Chem. Soc.* 72, 4302 (1950); Southwick *et al.*, *J. Org. Chem.* 15, 548 (1950). Activity: F. E. Gardiner, *Science* 90, 208 (1939). Crystal structure: S. S. Rajan, *Acta Cryst.* B34, 998 (1978). Toxicity study: G. W. Bailey, *White, Residue Rev.* 10, 97 (1965).



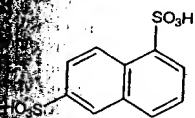
from water, mp 134.5-135.5°. Sol in about 30 parts water; sol in acetone, ether, chloroform. Soly in water 0.3 g/100 ml.  $LD_{50}$  orally in rats: 1000 mg/kg (Bailey, 1965). Growth regulator.

**8-Naphthalenediamine.** [479-27-6] 1,8-Diaminonaphthalene.  $C_{10}H_8N_2$ ; mol wt 158.20. C 75.92%, H 6.37%, N 17.71%. Prep by reducing 1,8-dinitronaphthalene with stannous chloride; Meyer, Müller, *Ber.* 30, 775 (1897).



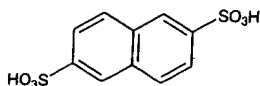
from oil alc, mp 66.5°. bp<sub>12</sub> 205°;  $n_D^{20}$  1.6828;  $d_4^{20}$  1.1729. Soluble. Turns brown on standing. Soluble in alcohol, slightly sol in water or chloroform. Oxidant for lubricating oils. Detection of selenium.

**1-Naphthalenedisulfonic Acid.** [525-37-1] Ebert-Merz  $\alpha$ -acid.  $C_{10}H_8O_6S_2$ ; mol wt 288.30. C 41.66%, H 2.80%, O 33.30%, S 22.24%. Prep: Fierz-David, Hasler, *Helv. Chim. Acta* 28, 257 (1945).



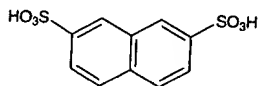
Deliquescent crystals. Very sol in water, alcohol; practically insol in ether.

**2-Naphthalenedisulfonic Acid.** [581-75-9] Ebert-Merz  $\beta$ -acid.  $C_{10}H_8O_6S_2$ ; mol wt 288.30. C 41.66%, H 2.80%, O 33.30%, S 22.24%. Prep: Fierz-David, Blangey, *Fundamental Processes of Dye Chemistry* (Interscience, New York, 1949) p 209.



Deliquescent crystals. Very sol in water, alcohol; practically insol in ether.

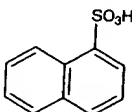
**6401. 2,7-Naphthalenedisulfonic Acid.** [92-41-1] Ebert-Merz  $\alpha$ -acid.  $C_{10}H_8O_6S_2$ ; mol wt 288.30. C 41.66%, H 2.80%, O 33.30%, S 22.24%. Prep from naphthalene and concd  $H_2SO_4$ : Fierz-David, Blangey, *Fundamental Processes of Dye Chemistry* (Interscience, New York, 1949) p 209.



Very deliquescent crystals. Very sol in water, alcohol; practically insol in ether.

USE: In dye chemistry.

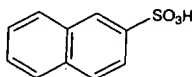
**6402. 1-Naphthalenesulfonic Acid.** [85-47-2]  $\alpha$ -Naphthalenesulfonic acid.  $C_{10}H_8O_3S$ ; mol wt 208.24. C 57.68%, H 3.87%, O 23.05%, S 15.40%. Made by sulfonating naphthalene with  $H_2SO_4$  at 0°.



Crystals. mp 90° (dihydrate). Freely sol in water or alcohol, slightly in ether.

USE: Manuf  $\alpha$ -naphthol. The sodium salt is used for rendering phenols sol in water.

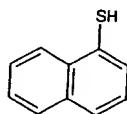
**6403. 2-Naphthalenesulfonic Acid.** [120-18-3]  $\beta$ -Naphthalenesulfonic acid.  $C_{10}H_8O_3S$ ; mol wt 208.24. C 57.68%, H 3.87%, O 23.05%, S 15.40%. Made by sulfonating naphthalene with  $H_2SO_4$  at 160°.



**Monohydrate.** White to slightly brownish, cryst leaflets; very hygroscopic. mp 124-125°. mp 91° when anhydr. Freely sol in water.

USE: Manuf  $\beta$ -naphthol and intermediates.

**6404. 1-Naphthalenethiol.** [529-36-2]  $\alpha$ -Thionaphthol; 1-thionaphthol; 1-mercaptanaphthalene; 1-naphthyl mercaptan.  $C_{10}H_8S$ ; mol wt 160.24. C 74.96%, H 5.03%, S 20.01%. Prep by catalytic sulfurization of naphthalene with S,  $S_2Cl_2$ , etc., followed by hydrogenation: Lazier *et al.*; Signaigo, US 2402645; US 2402686 (both 1946 to du Pont).



Liquid, strong mercaptan odor. Solidif on cooling.  $d_4^{20}$  1.1729;  $d_4^{20}$  1.607;  $d_4^{25}$  1.1549. bp<sub>760</sub> 285°; bp<sub>10.3</sub> 144.8°; bp<sub>2</sub> 138-140°.

Consult the Name Index before using this section.